

## Claims

- [c1] ①A method for sample preparation comprising:  
obtaining a sample comprising a first type of cells and a second type of cells,  
wherein the first type of cells is at least twice as susceptible to a lysis agent as  
the second type of cells; and  
applying the lysis agent to break the first type of cells.
- [c2] 2.The method of Claim 1 wherein the first type of cells is at least 5 times more  
susceptible to the lysis agent than the second type of cells.
- [c3] 3.The method of Claim 2 wherein the first type of cells is at least 10 times more  
susceptible to the lysis agent than the second type of cells.
- [c4] 4.The method of Claim 2 further comprising removing at least 60% of the  
second type of cells.
- [c5] 5.The method of Claim 4 further comprising removing at least 80% of the  
second type of cells.
- [c6] 6.The method of Claim 5 further comprising removing at least 90% of the  
second type of cells.
- [c7] 7.The method of Claim 6 further comprising removing at least 99% of the  
second type of cells.
- [c8] 8.The method of Claim 2 further comprising removing at least 90% the cellular  
content of first type of cells to obtain an isolation comprising second type of  
cells.
- [c9] 9.The method of Claim 8 further comprising removing at least 99% of the  
cellular content of the first type of cells to obtain an isolation comprising second  
type of cells.
- [c10] 10.The method of Claim 6, 7, 8, or 9 wherein the first type of cells are animal  
cells and the second type of cells are bacteria cells.
- [c11] 11.The method of Claim 10 wherein the lysis agent is a detergent.

- [c12] 12.The method of Claim 6, 7, 8, or 9 wherein the first type of cells are animal cells and the second type of cells are plant cells.
- [c13] 13.The method of Claim 6, 7, 8, or 9 wherein the first type of cells are animal cells and the second type of cells are fungi cells.
- [c14] 14.The method of Claim 6, 7, 8, or 9 wherein the first type of cells are gram negative bacteria and the second type of cells are gram positive bacteria.
- [c15] 15.The method of Claim 14 wherein the lysing agent is a relatively mild lysosome digestion followed by a cell membrane lysis agent with the conditions that is sufficient for digesting gram negative bacteria and not sufficient for digesting gram positive bacteria.
- [c16] 16.The method of Claim 6, 7, 8 or 9 wherein the first type of cells are yeast cells and the second type of cells are bacteria or plant cells.
- [c17] 17.The method of Claim 16 wherein the lysis agent is a zymolase, glucalase or lyticase digestion followed by a cell membrane lysis agent.
- [c18] ⑪8.A method for detecting nucleic acids comprising  
obtaining a sample comprising a first type of cells and a second type of cells,  
wherein the first type of cells is at least twice as susceptible to a lysis agent as the second type of cells;  
applying the lysis agent to break the first type of cells;  
removing at least 60% of the second type of cells to obtain an isolate;  
preparing a nucleic acid sample from the isolate.
- [c19] 19.The method of Claim 18 wherein the first type of cells is at least 5 times more susceptible to the lysis agent than the second type of cells.
- [c20] 20.The method of Claim 19 wherein the first type of cells is at least 10 times more susceptible to the lysis agent than the second type of cells.
- [c21] 21.The method of Claim 19 wherein the removing comprises removing at least 80% of the second type of cells.
- [c22] 22.The method of Claim 21 wherein the removing comprises removing at least

90% of the second type of cells.

[c23] 23.The method of Claim 22 wherein the removing comprises removing at least 99% of the second type of cells.

[c24] 24.The method of Claim 23 further comprising hybridizing the nucleic acid sample to a plurality of different nucleic acid probes.

[c25] 25.The method of Claim 23 wherein the plurality of different nucleic acid probes comprises at least 100 probes.

[c26] 26.The method of Claim 25 wherein the plurality of different nucleic acid probes comprises at least 1000 probes.

[c27] 27.The method of Claim 26 wherein the plurality of different nucleic acid probes comprise at least 5000 probes.

[c28] 28.The method of Claim 27 wherein the plurality of nucleic acid probes are immobilized on a substrate, each of the different probes is immobilized on a different location.

[c29] 29.The method of Claim 28 wherein the substrate is a solid surface.

[c30] 30.The method of Claim 28 wherein the substrate is a matrix.

[c31] 31.The method of Claim 27 wherein each of the different probes is immobilized on a bead.

[c32] 32.The method of Claim 27 wherein each of the different probes is immobilized on an optical fiber.

[c33] 33.The method of Claim 29 wherein the first type of cells are animal cells and the second type of cells are bacteria cells.

[c34] 34.The method of Claim 33 wherein the lysis agent is a detergent.

[c35] 35.The method of Claim 29 wherein the first type of cells are animal cells and the second type of cells are plant cells.

[c36] 36.The method of Claim 29 wherein the first type of cells are animal cells and

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the second type of cells are fungi cells.

- [c37] 37.The method of Claim 29 wherein the first type of cells are gram negative bacteria and the second type of cells are gram positive bacteria.
- [c38] 38.The method of Claim 37 wherein the lysing agent is a relatively mild lysosome digestion followed by a cell membrane lysis agent with the conditions that is sufficient for digesting gram negative bacteria and not sufficient for digesting gram positive bacteria.
- [c39] 39.The method of Claim 29 wherein the first type of cells are yeast cells and the second type of cells are bacteria or plant cells.
- [c40] 40.The method of Claim 39 wherein the lysis agent is a zymolase, glucalase or lyticase digestion followed by a cell membrane lysis agent.
- [c41] 41.The method of Claim 29 wherein the nucleic acid sample comprising RNA transcripts from the first type of cells or nucleic acids derived from the RNA transcripts from the first type of cells and wherein the nucleic acid probes are for detecting gene expression.
- [c42] 42.The method of Claim 29 wherein the nucleic acid sample comprising genomic DNA from the first type of cells or nucleic acids derived from the genomic DNA from the first type of cells and wherein the nucleic acid probes are for identifying the species of the first type of cells according to the genomic DNA sequence.
- [c43] 43.A method for detecting nucleic acids comprising  
obtaining a sample comprising a first type of cells and a second type of cells,  
wherein the first type of cells is at least twice as susceptible to a lysis agent as the second type of cells;  
applying the lysis agent to break the first type of cells;  
removing at least 80% of the cellular content of first type of cells;  
lysing second type of cells to obtain an isolate; and  
preparing a nucleic acid sample from the isolate.
- [c44] 44.The method of Claim 43 wherein the first type of cells is at least 5 times

more susceptible to the lysis agent than the second type of cells.

- [c45] 45.The method of Claim 44 wherein the first type of cells is at least 10 times more susceptible to the lysis agent than the second type of cells.
- [c46] 46.The method of Claim 45 wherein the removing comprises removing at least 90% of the cellular content of the first type of cells.
- [c47] 47.The method of Claim 46 wherein the removing comprises removing at least 99% of the cellular content of the first type of cells.
- [c48] 48.The method of Claim 47 further comprising hybridizing the nucleic acid sample to a plurality of different nucleic acid probes.
- [c49] 49.The method of Claim 49 wherein the plurality of different nucleic acid probes comprises at least 100 probes.
- [c50] 50.The method of Claim 49 wherein the plurality of different nucleic acid probes comprises at least 1000 probes.
- [c51] 51.The method of Claim 50 wherein the pluarlity of different nucleic acid probes comprise at least 5000 probes.
- [c52] 52.The method of Claim 51 wherein the plurality of nucleic acid probes are immobilized on a substrate, each of the different probes is immobilized on a different location.
- [c53] 53.The method of Claim 52 wherein the substrate is a solid surface.
- [c54] 54.The method of Claim 52 wherein the substrate is a matrix.
- [c55] 55.The method of Claim 51 wherein each of the different probes is immobilized on a bead.
- [c56] 56.The method of Claim 51 wherein each of the different probes is immobilized on an optical fiber.
- [c57] 57.The method of Claim 51 wherein the first type of cells are animal cells and the second type of cells are bacteria cells.

- [c58] 58.The method of Claim 57 wherein the lysis agent is a detergent.
- [c59] 59.The method of Claim 51 wherein the first type of cells are animal cells and the second type of cells are plant cells.
- [c60] 60.The method of Claim 51 wherein the first type of cells are animal cells and the second type of cells are fungi cells.
- [c61] 61.The method of Claim 51 wherein the first type of cells are gram negative bacteria and the second type of cells are gram positive bacteria.
- [c62] 62.The method of Claim 61 wherein the lysing agent is a relatively mild lysosome digestion followed by a cell membrane lysis agent with the conditions that is sufficient for digesting gram negative bacteria and not sufficient for digesting gram positive bacteria.
- [c63] 63.The method of Claim 51 wherein the first type of cells are yeast cells and the second type of cells are bacteria or plant cells.
- [c64] 64.The method of Claim 63 wherein the lysis agent is a zymolase, glucalase or lyticase digestion followed by a cell membrane lysis agent.
- [c65] 65.The method of Claim 51 wherein the nucleic acid sample comprising RNA transcripts from the second type of cells or nucleic acids derived from the RNA transcripts from the second type of cells and wherein the nucleic acid probes are for detecting gene expression.
- [c66] 66.The method of Claim 51 wherein the nucleic acid sample comprising genomic DNA from the second type of cells or nucleic acids derived from the genomic DNA from the second type of cells and wherein the nucleic acid probes are for identifying the species of the first type of cells according to the genomic DNA sequences

## Figures

FOOTNOTES